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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,399	10/08/2003	Yuanning Chen	TI-35212	7440

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EXAMINER

FARAHANI, DANA

ART UNIT	PAPER NUMBER
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2891

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/681,399

Applicant(s)

CHEN ET AL.

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 6, 8-15, 18, 19, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6, 8-15, 18, 19, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 9, 10, 11, 18, 19, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puchner (US Patent Application 2003/0045062), in view of Cabral et al., hereinafter Cabral (US Patent 6,921,711), both newly cited.

Re. claims 1, 11, 19, 24 and 25, Puchner discloses in figure 1-6, forming a gate 20 (of a PMOS or NMOS, see paragraph 18) on a semiconductor substrate; after forming the gate, selectively depositing oxide 22 and 18 on the top surface of the gate, as well as that of the substrate, the opposing side surfaces of the gate being substantially free of the oxide material; forming spaces on the opposing side surfaces of the gate subsequent to depositing the oxide material, the spacers contacting the opposing side surfaces of the gate substantially along the opposite side surfaces.

Puchner does not disclose the oxide is one of the materials (e.g. silicon oxynitride), as claimed.

Cabrel discloses that high K dielectric gate insulators, such as silicon oxynitride protect against dielectric breakdown without sacrificing switching performance. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the gate dielectric of the Puchner as a silicon oxynitride, since it is well known that high K gate

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dielectrics, such as silicon oxynitride protect against dielectric breakdown, and make the top of the gate insulator as the same material to simplify process of making the device by virtue of using the same material as the top of the gate insulator, since it would have been readily available.

Re. claim 2, Puchner discloses the limitations in the claims, as discussed above, except for expressly stating that its polysilicon gate is doped. It would have been obvious to one of ordinary skill in the art at the time of the invention to dope the gate, since it is common practice to dope a polysilicon gate in order to reduce the resistance of the gate.

Re. claims 9, 10, and 18, Puchner in view of Cabral renders obvious the claimed invention, as discussed above, also disclosing LDD regions (paragraph 45), but does not disclose the LDD regions are formed after forming the gate but before depositing the oxide layer, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the order of forming these regions, according to the manufacturing environment and convenience of one of ordinary skill in the art. See *Ex Parte Rubin* 126 USPQ 440 (BAP1 1959) for the proposition that reversing the order of a process sequence cannot be considered an act of invention.

3. Claims 8, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puchner in view of Cabrel as applied to claim 1 above, and further in view of Jin et al., (US Patent 6,734,108), hereinafter Jin, previously cited.

Puchner in view of Cabrel renders obvious the claimed invention, as discussed above, except for a nitride layer over the gate and the process recited in these claims, to form the spacers. Jin discloses this limitation, as discussed in the Office Action of 9/25/06. Therefore, it

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would have been obvious to one of ordinary skill in the art at the time of the invention to make the spacers in that manner, since it is a well known manner of making spacers of a gate.

4. Claims 4, 6, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puchner in view of Cabrel, as applied to claims 1 and 12 above, and further in view of Jeng (US Patent 6,303,490), previously cited.

Puchner in view of Cabrel renders obvious the claimed invention, as discussed above, except for an anisotropic Physical Vapor Deposition (PVD) which comprises one of collimated sputtering, long throw sputtering or ionized metal plasma method is used in depositing the oxide material.

Jeng discloses anisotropic ionized metal plasma sputtering method is used for deposition which gives a good surface coverage (see column 4, lines 24-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this method to deposit the oxide layer of the Puchner reference, since the advantages of using the method, such as the advantage mentioned above is well known in the art.

Response to Arguments

5. Applicant's arguments with respect to the previously rejected have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

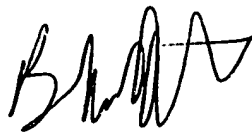
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DF



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